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Regional Visions for Integrated Watershed Management

The development of regional visions for integrated water resources planning and management is key to implementing our Civil Works strategic plan. The Corps is advocating approaches that apply integrated tools and perspectives for defining problems and developing solutions with the potential to achieve sustainability for our economy, environment, and quality of life. Our future depends on it.

The value of an integrated watershed approach is the potential to achieve greater benefits and effectiveness in meeting national water challenges than an isolated project approach. Integration of programs and perspectives can be a force multiplier, not just for the Corps but also for all stakeholders and public programs in the region. The more people contribute to the solution, the more sweeping and long-lasting the solutions can be.

The management of water and related resources based on a watershed perspective is not new, however it has received renewed emphasis in both science and policy. The last two decades have brought considerable emphasis on environmental quality and integrated management approaches to watershed resources. The new ethic of sustaining economic prosperity while preserving environmental quality requires management approaches that integrate human and natural systems. Watershed approaches that apply the physical, biological, social and economic sciences in problem solving for multiple needs and opportunities in a region are essential to achieving this integration.

The concept of "watershed" is not new to the Corps of Engineers. Throughout the history of the Corps, a watershed approach has been, at varying levels, integrated into the process by which water resource systems have been investigated. The geographic "basin" organization of the Corps Civil Works program is in keeping with the Corps' historic understanding of the necessity to manage water resource activities within a watershed context. Many activities occurring in a watershed are inter-related and, therefore, managing water resources has evolved to more of a holistic, collaborative effort. The Corps has developed a watershed perspective to guide water resources development, protection, and management within the Civil Works program; see http://www.usace.army.mil/inet/functions/cw/cecwp/branches/guidance_dev/pgls/pdf/pgl61.pdf .

This watershed perspective acknowledges Corps responsibility as a major stakeholder in many of the Nation's watersheds, and in its roles often represents many other stakeholder interests. It emphasizes consideration of the regional dimensions of "locally perceived problems" in studies and the operation of existing projects - as modifications to the operations may often be integral to creative integrated management approaches. The perspective applies to all Civil Works programs and functions, including planning, design, construction, operation, maintenance, restoration, rehabilitation, and regulatory activities. It will facilitate integration of the eight Civil Works business programs in the identification and development of new Corps initiatives. The Corps' application of this watershed perspective in conjunction with other agencies and partners, will help assure water resources sustainability, and improve performance, customer satisfaction, and overall program efficiency and effectiveness.

A key to achieving long-lasting benefits in a watershed is the ability to pull together coalitions and councils working toward common aims in developing and implementing effective strategies. The Corps' major subordinate commands (MSCs) and districts can play a critical role in bringing these

coalitions together to foster ways to create shared visions and to achieve mutual goals involving watershed resources planning, development, protection and management. In other instances the Corps is an active participant in coalitions lead by others.

The opportunities for integrated watershed management within the Civil Works program have increased with the increase of watershed and comprehensive study authorizations. Both single-purpose and multi-purpose studies directed at watershed resources problems and opportunities from a systems (watershed) perspective provide enormous opportunity for integrated problem solving to address the growing complexity embedded in our water resources issues.

While an integrated watershed approach makes sense, like other regional, multi-objective, multi-player approaches, implementation can be challenging. Federal agencies may share a desire for watershed solutions but their different missions confound chances for integration. We must overcome barriers to collaboration emanating from disparate and often fragmented authorities designed to tackle different aspects of watershed resources management. Too often we maximize the "eaches" and sacrifice the whole. The tendency is to break water resources problems into bite-size, manageable pieces. Within the Corps, we also recognize the need to improve our "corporate" integration of functions and programs within watershed contexts. We will increase efforts to define commonly desired outcomes and thereby reassemble the pieces if they have been fragmented. We will work to gain support for this approach, as ribbon-cutting ceremonies celebrate project completion, and undervalue integrated plans for strategic implementation. The development of joint agency budget submittals for agency programs with integrally critically linked components may maintain component integration as implementation proceeds, along with funding support for components whose optimum performance is related to interconnectivity.

Numerous Civil Works watershed and comprehensive study opportunities are emerging that hold promise for addressing these challenges in the application of integrated watershed resources management. Several examples are provided below. Experiences with these and others will help improve Corps abilities to address the challenges of integrated watershed management. The collaborative multi-agency, multi-government partnerships fostered by these efforts will also be valuable in individual projects and activities.

- The Morganza to the Gulf Study (Louisiana) is examining needs and opportunities associated with hurricane protection in a 1280 mi^2 area. The study is addressing opportunities to reduce hurricane storm and surge damage to both municipalities and ecological communities, and the capability to prevent salinity intrusion into the freshwater marsh and associated water bodies (>500,000 acres) and municipal water supplies. A multi-agency team is participating in the project formulation and selection, and a number of the features (e.g. for tidal exchange/control features) are included at their recommendation. The collaborative effort has resulted in synergy across agency programs and several projects to be implemented by other agencies will be designed to work in concert with this plan.

- The White River Basin Comprehensive Study (Arkansas and Missouri), includes collaboration of two Corps districts (Memphis and Little Rock,) in identifying problems and opportunities, and proposing solutions to water resources related problems in the White River Basin. The comprehensive plan developed will serve as a framework for examining the water resources problems and potential solutions within the basin. The study will examine navigation, flood damage reduction, feedlot runnoff, hydropower, ecosystem restoration and protection, recreation, critical aquifer protection, and agricultural water supply issues. Existing Corps navigation and flood damage reduction (reservoirs and levees) projects located within the basin, and other ongoing studies will be integrated in study considerations and information sharing. The alternatives identified may be implemented by some combination of the Corps, other Federal, state, or local agencies. A conceptual "model" describing the interrelationships of the significant resources in the basin will be developed to provide a framework for evaluating alternatives. The resource conditions will be examined and projections made of the future resource conditions of the resources. The study results will be used in evaluating the operation of existing projects relative to the management goals to be developed for the basin.

- The St. Mary's River Watershed Restoration Study is designed in two phases. The first phase is developing a growth management plan, based on sub-watersheds in a rural area transitioning to suburbs. An extensive watershed characterization has been completed to assess and analyze existing stream conditions, and the most likely future conditions, if suburban growth continues. Alternative ctions that can be taken now to minimize the future impacts are being examined. The majority of recommendations are in the form of local actions such as land use regulation, development permitting, low impact development techniques, and stormwater management options. This phase will culminate in an extensive watershed management report, designed to help the County Government manage their resources. A second phase will examine site specific restoration opportunities (which are relatively few) and will culminate in a traditional feasibility study document. Partners include: St. Mary's County, Maryland Department of Natural Resources, and the Center for Watershed Protection.

- The Mattawoman Creek study is a mix of hydrologic modeling and GIS analysis, designed to provide an overview of existing sub-watershed characteristics and future conditions. This study will use a hydrologic model to assess the effects of BMP's and other initiatives on future water quality. This study is also examining impacts from future land use change and other changes in the character of each sub-watershed. The purpose of this study is to provide a document that evaluates and justifies changes to zoning and subdivision codes for the protection of the Mattawoman estuary. This document will feature extensive watershed profiles, highlight resources, existing and future land use, water quality and other environmental resource issues. Recommendations will be focused on local management options.

- The Bayou Manchac Watershed (Louisiana) study will review existing projects in the basin and prepare an action plan for the 30,000 acre watershed to achieve flood-damage reduction and ecosystem restoration benefits. An ideal opportunity exists to develop a multi-purpose project to address flood damages and environmental needs. One of the largest remaining tracts of seasonally flooded bottomland hardwoods left in the Mississippi Alluvial Valley exists in the lower basin. Consideration will be given to many public issues including navigation, water quality, recreation, eco-tourism, bird watching, and education. The study team is comprised of Federal, state, and local agencies, as well as several representatives of the public. See: http://www.mvn.usace.army.mil/prj/bayou-manchac-watershed . Another study involving the Amite River and tributaries(Mississippi and Louisiana) is underway to investigate a watershed approach to addressing ecosystem restoration, flood damage reduction, and better management practices, e.g. involving sand and gravel operations, in the watershed.

- The Lake Allatoona/Etowah River Watershed Study (Georgia) is examining streambank and shoreline erosion, sedimentation, water quality, fish and wildlife habitat degradation, and other problems relating to ecosystem restoration and resource protection in the rapidly urbanizing 700,000 acre watershed. Addressing the issues requires a landscape approach and involvement by not only other Federal agencies, but eight counties and numerous municipalities. The problems facing the watershed area are so widespread and varied in nature that no one measure at a specific location, or set of actions by a single entity can provide the solution. The product from the study is expected to include a combination of structural and non-structural measures, including actions necessary by local governments, and contributions by state and Federal agencies.

- The Sacramento and San Joaquin River Basins Comprehensive Study (California) is examining flood management while integrating ecosystem restoration on a system-wide basis (channels and floodplains of the two rivers and the lower reaches of their major tributaries) in the Central Valley. The system of flood management facilities, including dams, levees, weirs, and bypass channels developed in the early 1900's is being examined to address contemporary flood and ecosystem management needs. The system has allowed agricultural and urban development to flourish in the historic floodplains. Settlement of the region over the past 150 years has been responsible for loss of approximately 90 percent of the riparian and wetland vegetation from the Central Valley. Projected population growth has potential to impact water and land use in the floodplain affecting both flood management infrastructure and ecosystem health. Important ecological communities (open water, wetlands, vernal pools, riparian areas, uplands), waterfowl wintering areas, rare plants and animals are of concern. The study is using an iterative approach, supported by public input to develop alternative master plans that achieve a range of flood damage reduction and ecosystem restoration outputs. Alternative master plans will be compared to identify the set of components that best meets overall study objectives and guide development

of a recommended master plan. The study team is working closely with the CALFED Bay-Delta Program, agencies implementing the Central Valley Project Improvement Act, and other major programs in the region. http://www.compstudy.org/

- An Upper Rio Grande Water Operations Model is being developed through collaborative efforts of two cities and six Federal agencies, including the Corps. A unified water operations model is being developed for use in flood control operations, water accounting and evaluating water operations alternatives for the Rio Grande, from its headwaters in Colorado to below Caballo Dam in New Mexico. Additional entities are participating through technical review and outreach support. http://www.spa.usace.army.mil/urgwom

- An ongoing demonstration program is examining the application of regional sediment management as an approach involving better coordination of dredging activities, and shore protection and ecosystem restoration projects, in conjunction with coastal sediment needs to foster more balanced natural system processes and reduce project costs. Key to this effort is the consideration of sediment as a "resource" and the integration of projects and programs related to sediment in a region. See http://www.wes.army.mil/rsm/

- A California Sediment Management Workgroup, formed by the California Resources Agency and the Corps, is facilitating regional approaches to protecting, enhancing and restoring California's coastal beaches and watersheds through cooperative multi-government efforts. Natural flows of sediment to and along the coast have been significantly affected by extensive human alteration. Watersheds no longer provide a sufficient supply of sediment to beaches, wetlands are often compromised because of too much sedimentation, and beaches can erode away due to lack of sand. The workgroup, which is a Federal, state and local government partnership, has found that piecemeal identification of problems and implementation of site-specific solutions do not effectively address these critical problems. Flood control, navigation, water supply, water quality, habitat, bluff erosion, landslides and shoreline change are all important management issues and must be viewed together for effective and efficient management. A California Coastal Sediment Management Master Plan has been proposed to evaluate California's coastal sediment management needs on a regional, system-wide basis. The plan would include watersheds and nearshore waters to provide a comprehensive, system overview of regional sediment management needs. It would provide an inventory and strategic vision of the overall state coastal sediment management needs, and identify regions for evaluation along with priority sites for action. http://www.spd.usace.army.mil/csmwonline/

- The Corps has applied Shared Vision Planning (SVP) to a number of water conflict situations and this approach will be useful in integrated watershed management. SVP, developed during the National Drought Study, is useful for not only addressing stubborn conflicts; it provides a way to do watershed or river basin management on a longer term basis, with stakeholder involvement in rigorous planning analysis. SVP includes a structured public involvement approach called "circles of influence", and Shared Vision Models are used to evaluate different alternative plans according to a full range of decision criteria. The models are built with involvement of decision makers and stakeholders so that there are no "black boxes". SVP was applied on the ACT-ACF study and is currently being applied in the IJC Lake Ontario study. Information on SVP background and applications can be found at: http://www.iwr.usace.army.mil/iwr/svp/svppage.htm .

- Recent authorities provide considerable opportunity to advance integrated watershed management. For example, the last Water Resources Development Act (WRDA) provides the Corps a specific authority to assess water resources needs of river basins and watersheds of the U.S., including needs related to ecosystem protection and restoration, flood damage reduction, navigation and ports, watershed protection, water supply and drought preparedness. Products from these assessments can include watershed plans with strategies for actions to be taken by both the Federal and non-Federal partners and stakeholders in order to address the regionally identified suites of needs and opportunities. These critical plans will be developed in a collaborative and open process involving the full range of interested stakeholders.

- The proposed Fiscal Year 2002 Water Resources Development Act (WRDA) includes provisions which are relevant to integrated watershed management. Several regional ecosystem authorities will enhance the Corps ability to participate in and respond to the demand for more integrated approaches to ecosystem restoration; these include: Coastal Louisiana, San Francisco Estuary Watershed, Chesapeake Bay Restoration Amendment,

San Juan Bay Estuary. These authorities, if approved and funded, will enable the Corps to participate with other Federal and non-Federal partners in addressing regionally prioritized restoration and management goals.

- A new Urban River Restoration Initiative is being proposed in response to requests from municipalities who have emphasized that efficient restoration of the health of urban rivers and streams requires examination of regional solutions beyond their individual municipal limits. The authority would allow the Corps to plan the comprehensive restoration of urban rivers in the interest of ecological restoration and economic revitalization and to do so in cooperation with the EPA and other Federal and state and local agencies. Corps plans would include wastewater treatment and related facilities combined sewer and sanitary sewer overflow and other stormwater management measures, removal or remediation of contaminated sediments, creation or restoration of habitat and other ecological values.

The need for integrated approaches to meeting water challenges was identified as a major theme from the recent listening sessions, (see http://www.iwr.usace.army.mil/iwr/waterchallenges/). Participants emphasized that these approaches must treat watersheds as systems with alternative outputs, and that stewardship of watershed resources requires consideration of the costs and benefits of the alternative uses of these resources. The public emphasized that Federal leadership in establishing system linkages is essential to achieving this integration. Our regional offices or MSCs are working to identify watershed needs, formulate problem statements with all concerned stakeholders, and facilitate planning toward solutions with the potential to tackle the magnitude of regional problems.